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Wu et al.

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(54) **CABLE CONNECTOR ASSEMBLY WITH IMPROVED SPACER**

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H01R 13/436	(2006.01)
H01R 107/00	(2006.01)
H01R 24/64	(2011.01)

(52) **U.S. Cl.**

CPC ***H01R 13/6581*** (2013.01); ***H01R 13/4367*** (2013.01); *H01R 9/03* (2013.01); *H01R 24/64* (2013.01); *H01R 2107/00* (2013.01)

(58) **Field of Classification Search**

CPC H01R 13/6658; H01R 13/658; H01R 13/65802; H01R 13/506; H01R 23/6873; H01R 23/7073; H01R 43/24; H01R 9/032

USPC 439/607.58, 607.54, 607.5, 607.41, 439/607.27

See application file for complete search history.

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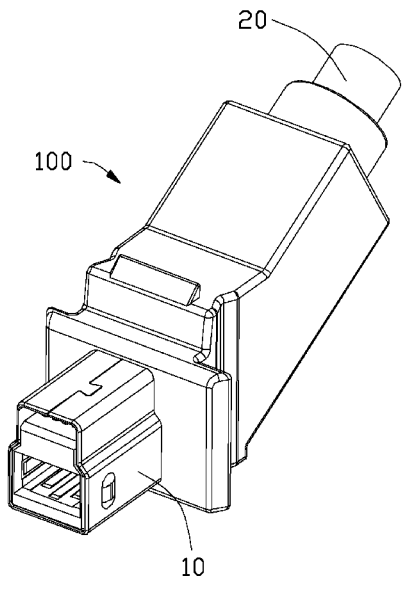
(57) **ABSTRACT**

A cable connector assembly including: a cable including a number of wires, an insulative housing, a number of contacts retained in the insulative housing and soldered to corresponding wires of the cable, a spacer assembled to the insulative housing and retaining respective rear portions of the contacts, a metal case enclosing the insulative housing and having a slit, a copper foil enclosing the metal case and covering the slit, and an insulative member over-molded on the copper foil and a front end of the cable, wherein the spacer defines a sustaining portion extending into the slit for supporting a portion of the copper foil located above the slit.

8 Claims, 9 Drawing Sheets



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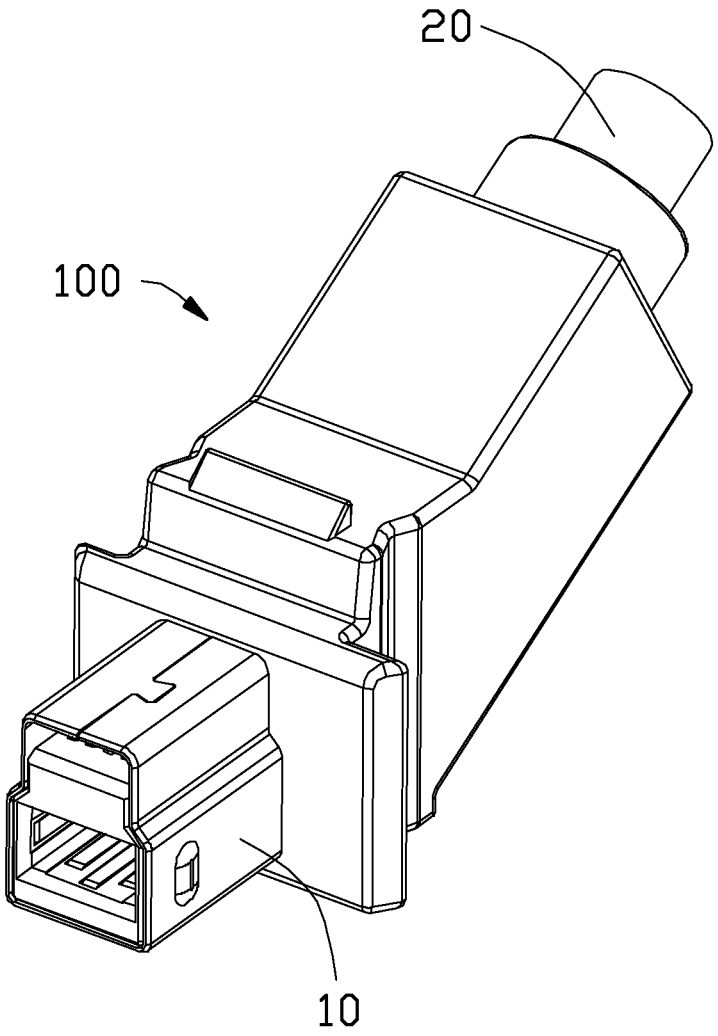
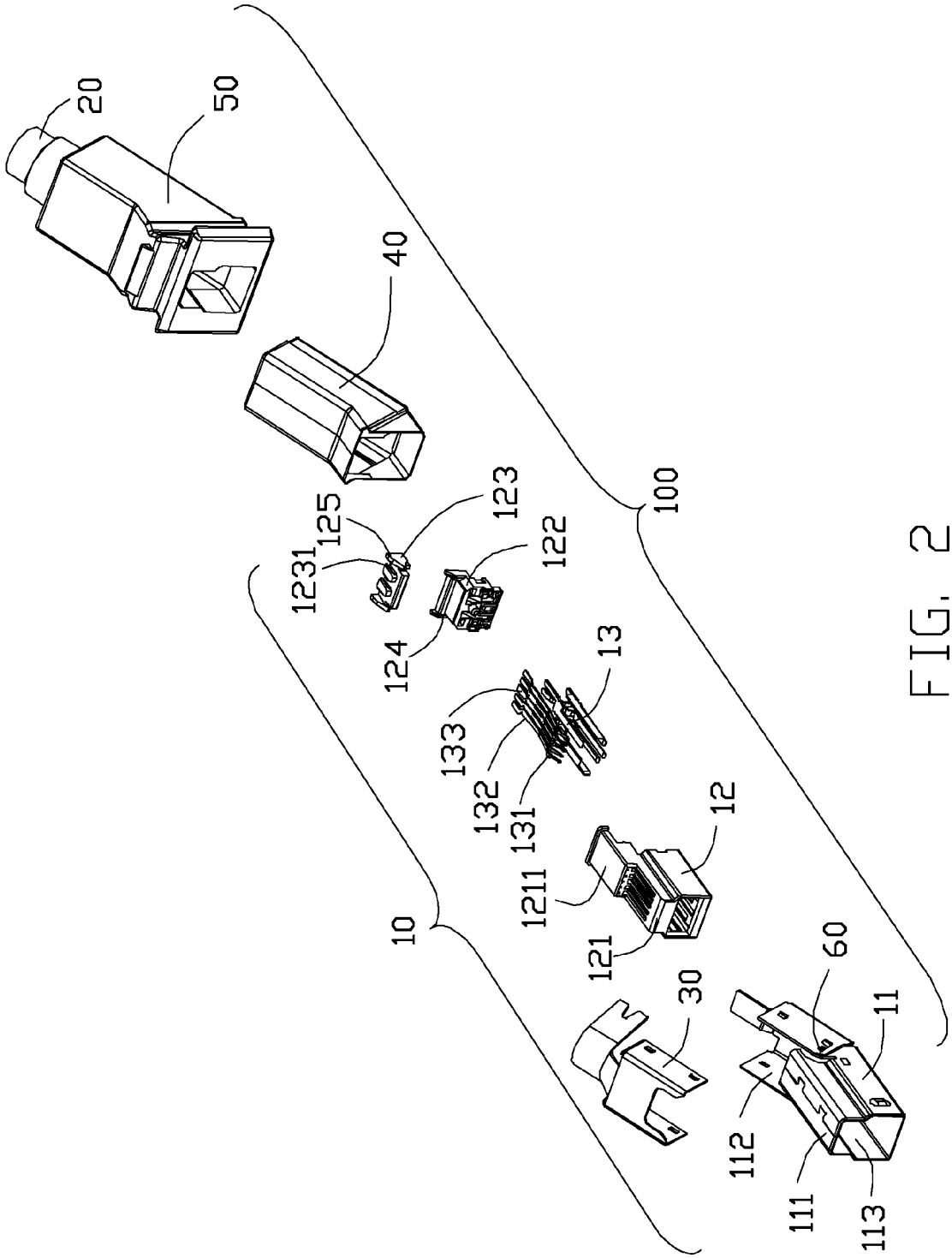


FIG. 1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50
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100
123
125
1231
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1211
121
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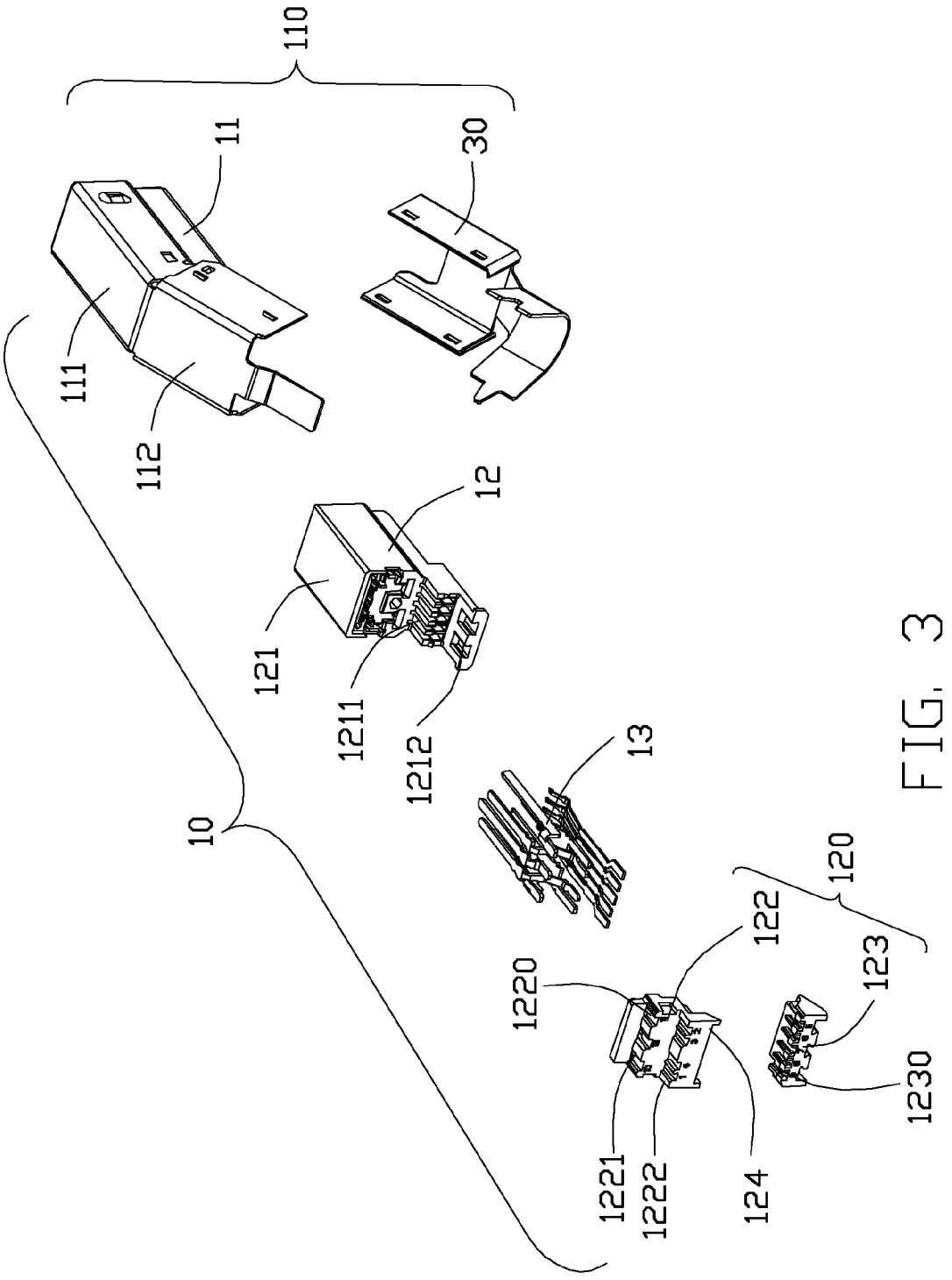
30
60
11
112
111
113

FIG. 2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11
30
111
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12
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1212
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120
122
1220
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1230
1221
1222
124

FIG. 3

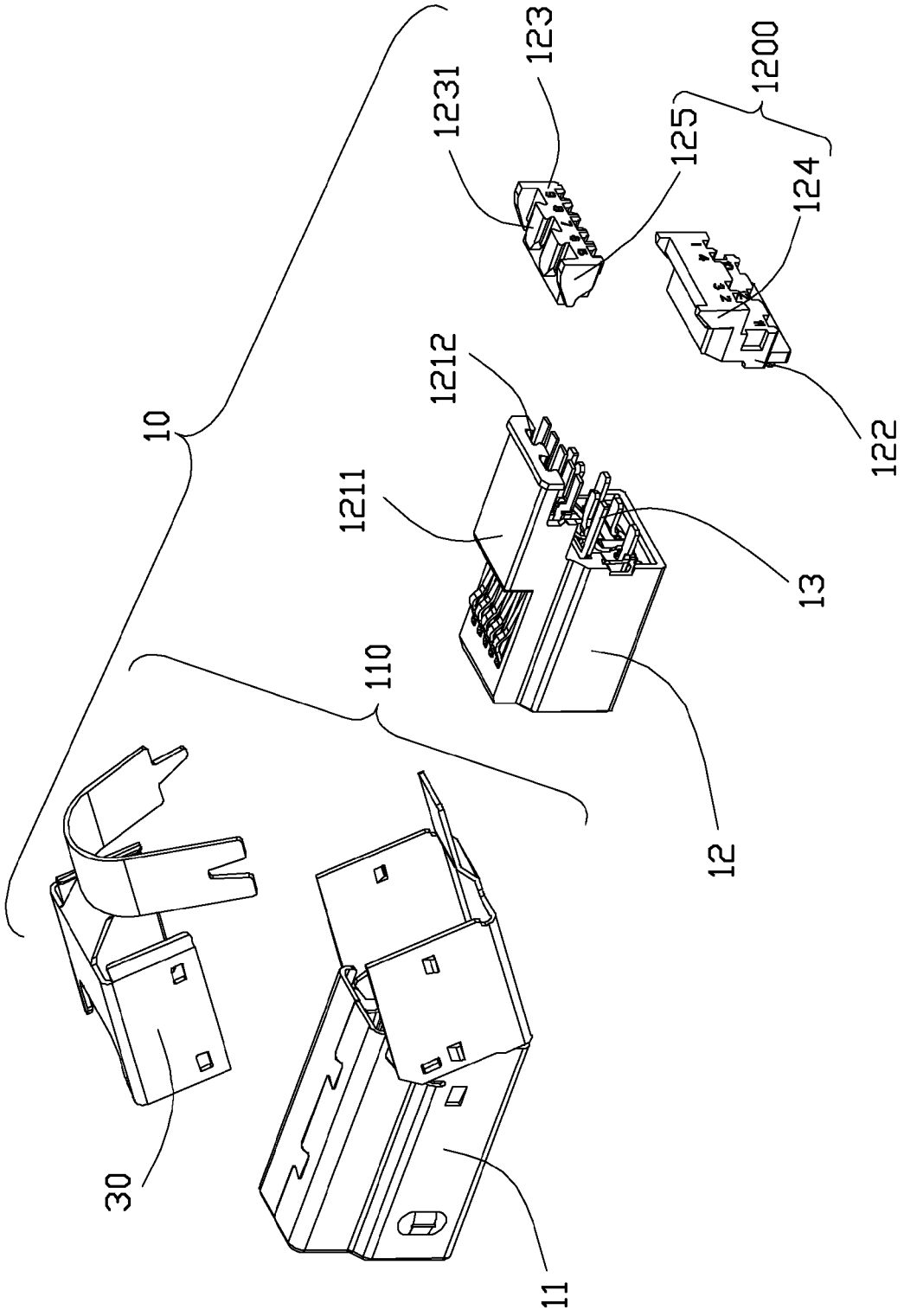

FIG. 4

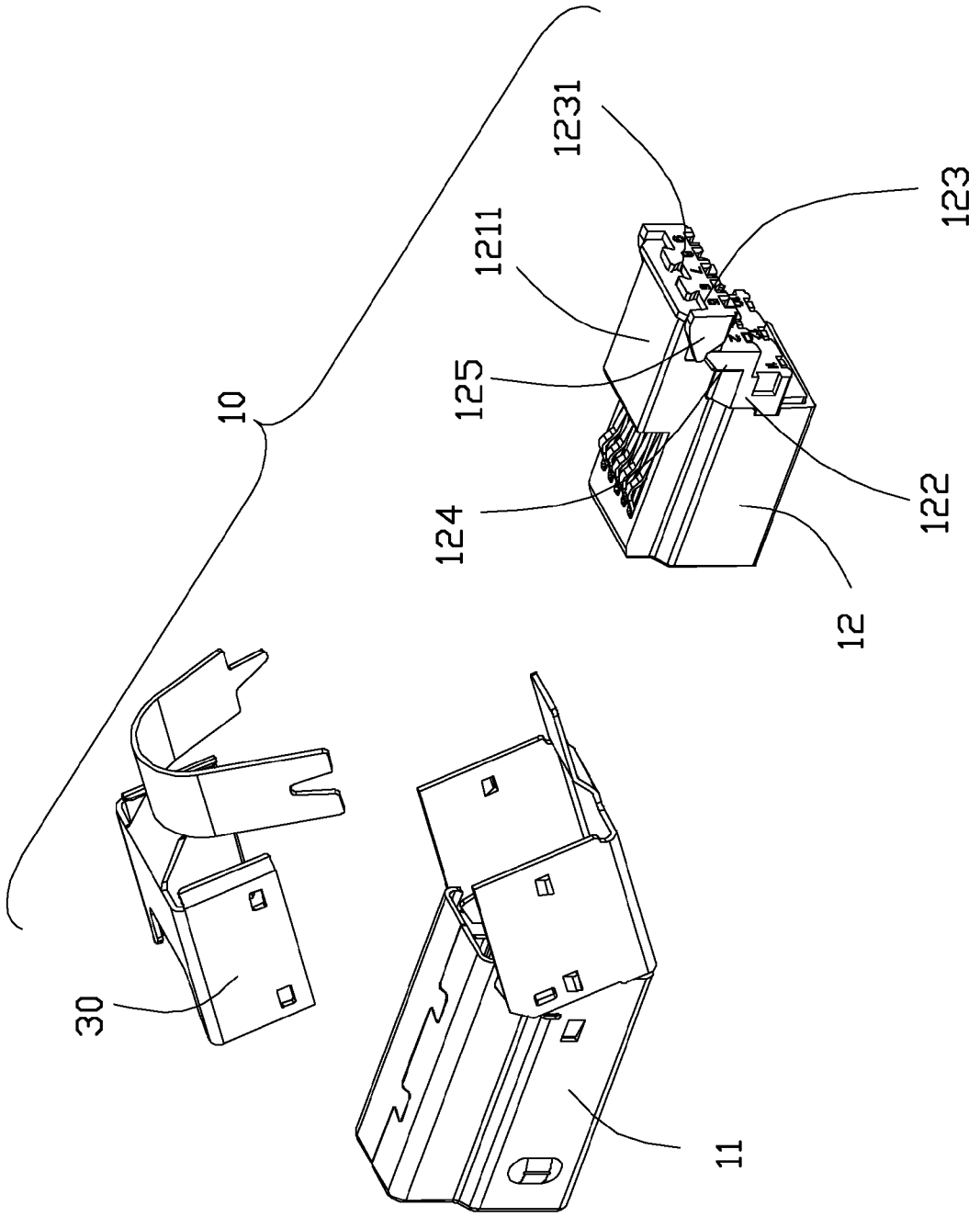

FIG. 5

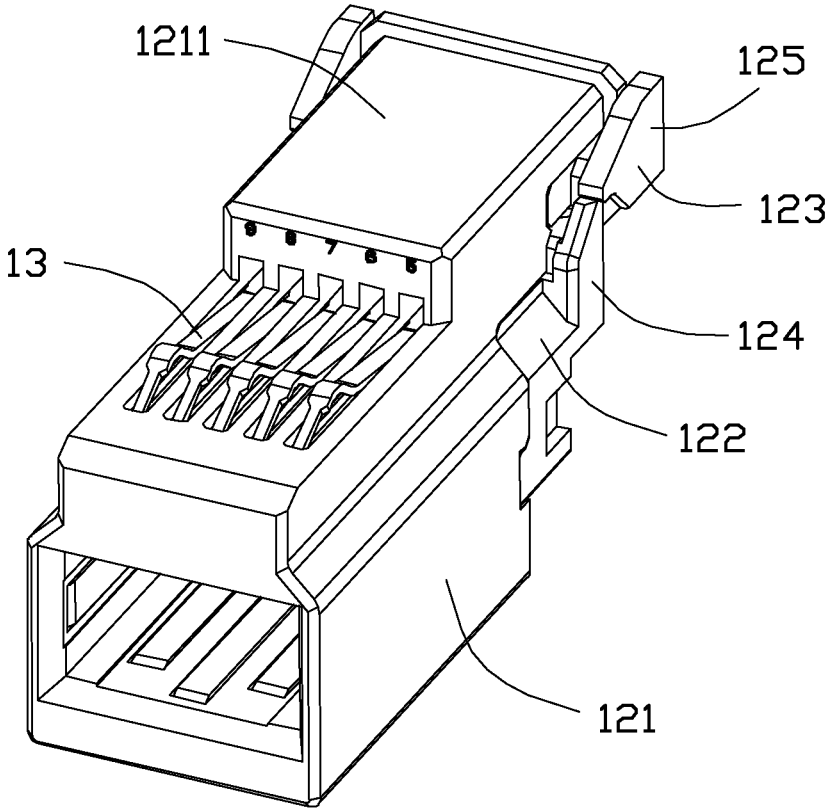

FIG. 6

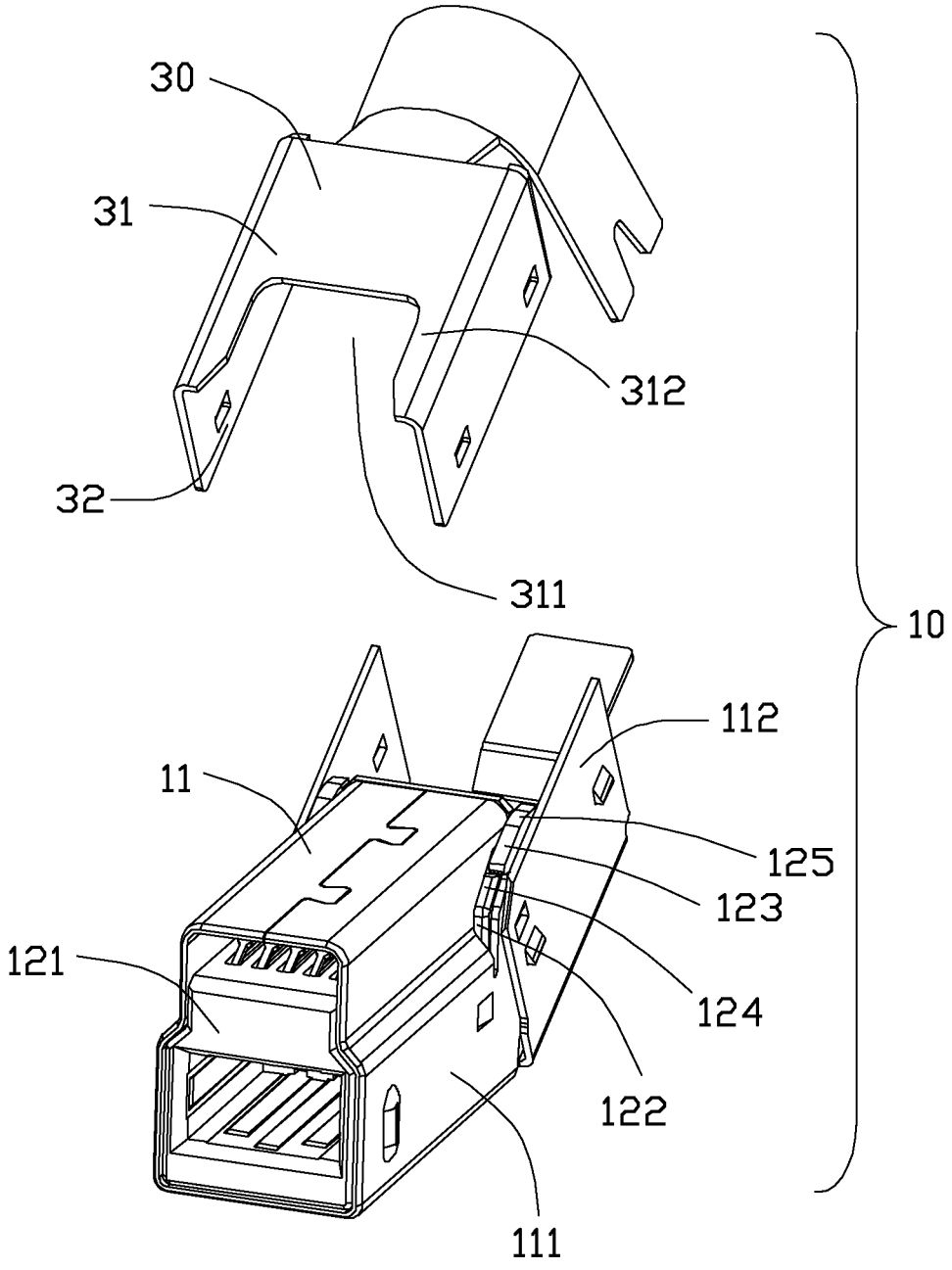

FIG. 7

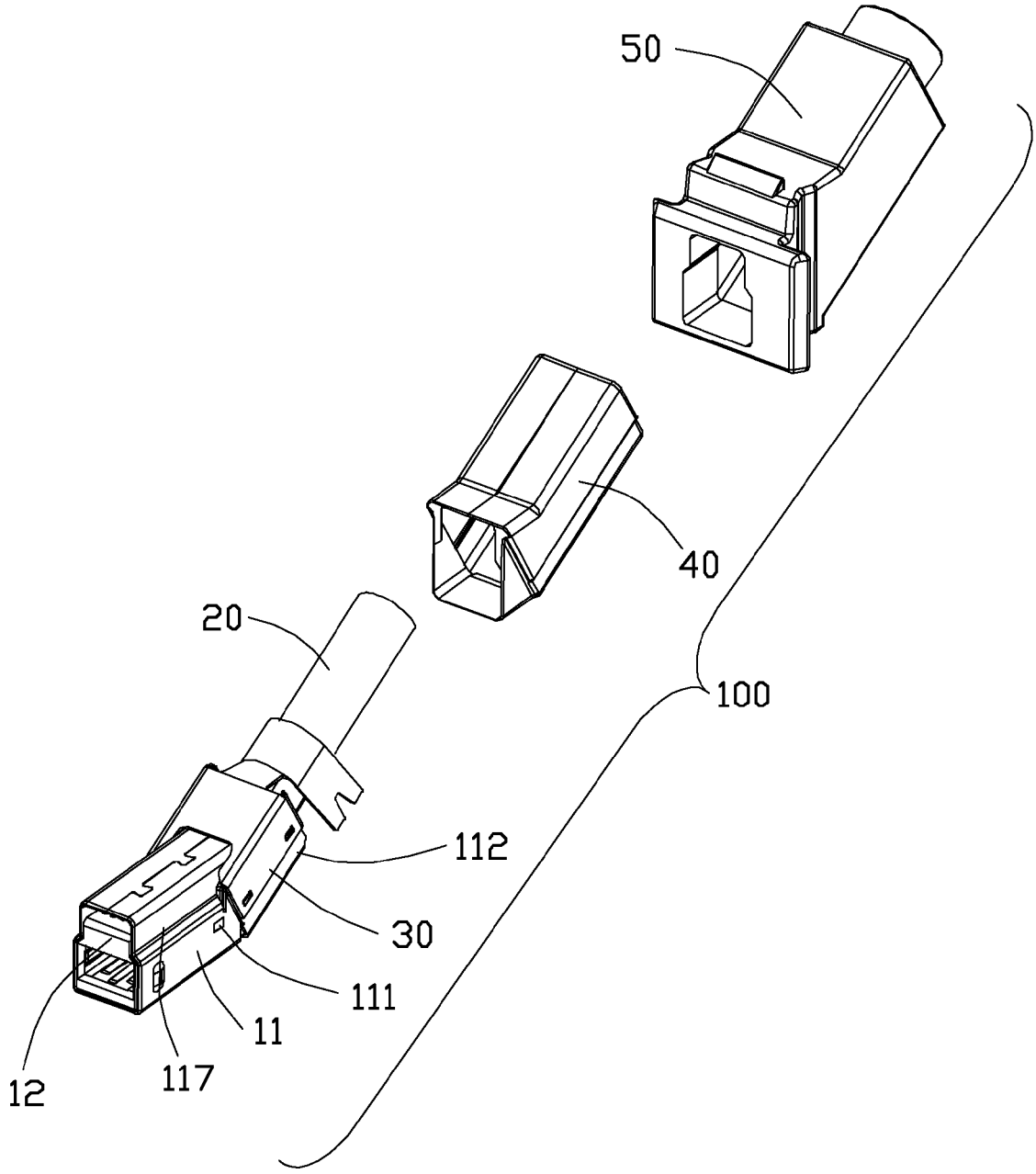

FIG. 8

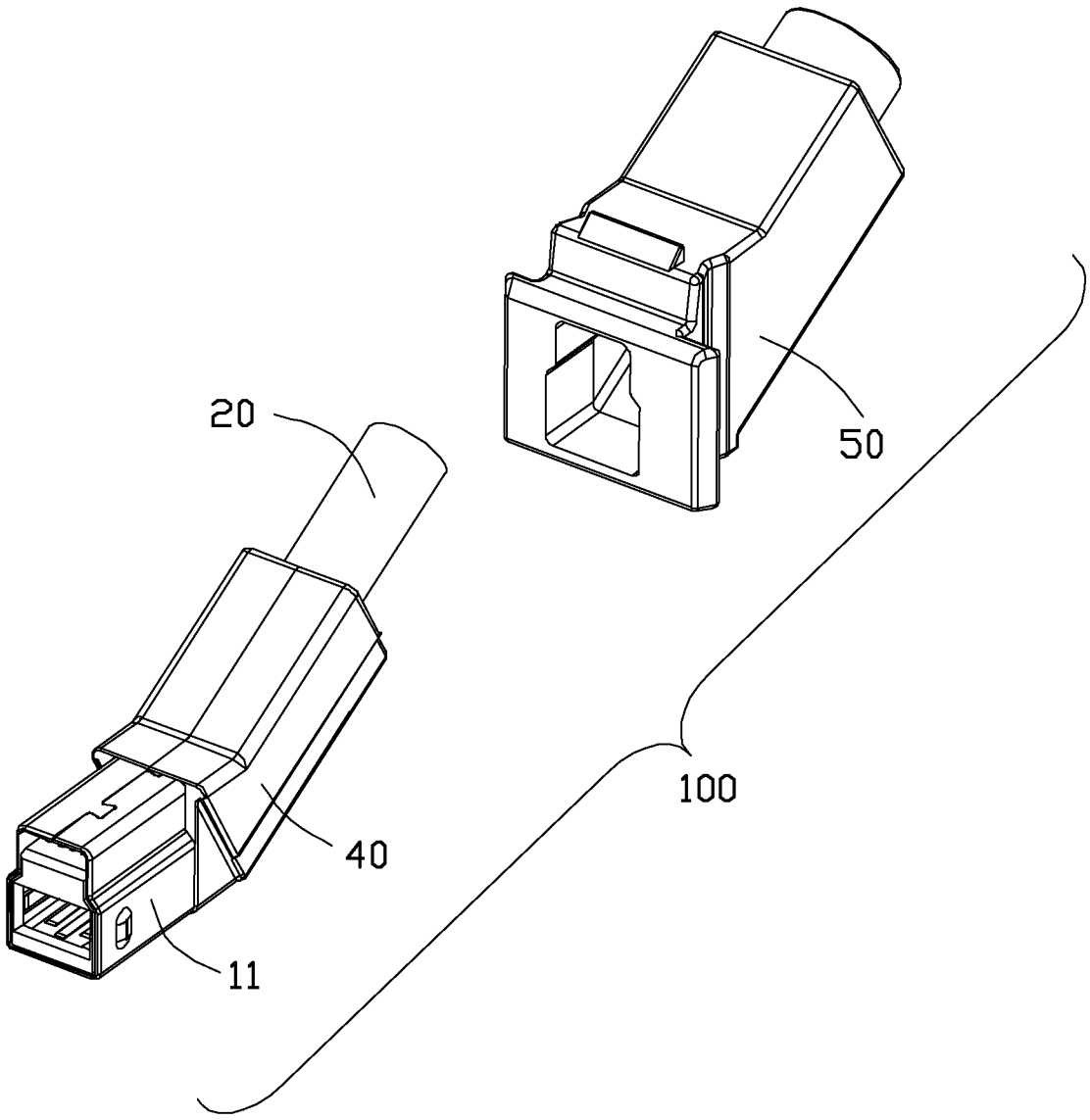

FIG. 9

CABLE CONNECTOR ASSEMBLY WITH IMPROVED SPACER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a cable connector assembly, and more particularly to a cable connector assembly having improved shielding effect.

2. Description of Related Art

Universal Serial BUS (USB) is a widely used input/output interface adapted for many electronic devices, such as personal computers and related peripherals. Nowadays, USB forum has published several specification editions for USB, and transmitting rate of USB has become higher and higher. As electronic industry develops, higher transmitting rate of USB based connection accessory is needed.

A USB 3.0 POWER-B cable connector assembly usually includes an electrical connector, a cable electrically connected with the electrical connector, and an insulative member over-molded around the electrical connector and a front portion of the cable. The electrical connector includes an insulative housing and a metal case enclosing the insulative housing. The insulative housing usually defines a narrower upper portion and a wider lower portion. Due to the limits of manufacturing technology, a slit is formed on two opposite sides of the metal case. Therefore, the cable connector assembly further includes a copper foil enclosing the metal shell to enhance the shielding effect. However, when the insulative member is over-molded, the copper foil located at the slit is easily broken for a lack of effective support by the metal case.

Hence, a cable connector assembly with improved spacer is desired to overcome the above problems.

BRIEF SUMMARY OF THE INVENTION

According to one aspect of the present invention, a cable connector assembly comprises: a cable including a number of wires, an insulative housing; a plurality of contacts retained in the insulative housing and soldered to corresponding wires of the cable, a spacer assembled to the insulative housing and retaining respective rear portions of the contacts, a metal case enclosing the insulative housing and having a slit, a copper foil enclosing the metal case and covering the slit, and an insulative member over-molded on the copper foil and a front end of the cable, wherein the spacer defines a sustaining portion extending into the slit for supporting a portion of the copper foil located above the slit.

The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. Additional features and advantages of the invention will be described hereinafter which form the subject of the claims of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention, and the advantages thereof, reference is now made to the following descriptions taken in conjunction with the accompanying drawings, in which:

FIG. **1** is a perspective assembled view of a cable connector assembly according to the present invention;

FIG. **2** is an exploded view of the cable connector assembly shown in FIG. **1**;

FIG. **3** is a view similar to FIG. **2** but with several elements removed;

FIG. **4** is partly assembled view of the electrical connector shown in FIG. **3**, but from a different perspective;

FIG. **5** is a further assembled view of the electrical connector shown in FIG. **4**;

FIG. **6** is a different perspective view from FIG. **5** with several elements removed;

FIG. **7** is a further assembled view of the electrical connector shown in FIG. **5**;

FIG. **8** is a partly assembled view of the cable connector assembly shown in FIG. **2**; and

FIG. **9** is a further assembled view of the cable connector assembly shown in FIG. **8**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **1-2**, a cable connector assembly **100** according to a preferred embodiment of the present invention includes an electrical connector **10**, a cable **20** electrically connecting to the electrical connector **10**, a copper foil **40** enclosing a conjunction area between the electrical connector **10** and the cable **20**, and an insulative member **50** over-molded around the copper foil **40**.

Referring to FIGS. **3-6**, the electrical connector **10** includes a metal case **110**, an insulative housing **12** contained in the metal case **110**, a spacer **120** assembled to a rear end of the insulative housing **12**, and a number of contacts **13** retained in the insulative housing **12**. The metal case **110** includes a first case **11** and a second case **30** engaged with the first case **11**. The cable **20** includes a number of wires for transmitting electrical signals, and the wires are electrically connected to the corresponding contacts **13**.

Referring to FIGS. **2-5**, the first case **11** includes a tubular portion **111** and a drawer-shaped portion **112** obliquely and upwardly extending from a rear end of the tubular portion **111** along a front-to-back direction. A receiving space **13** is formed by four conjunctive walls of the tubular portion **111**, and the width of a top wall is less than the width of a bottom wall, thus symmetrically, two step-shaped portions are formed on the two side walls respectively. Two sidewalls of the drawer-shaped portion **112** respectively are against the outside of the two sidewalls of the tubular portion **111** and fixed to the corresponding sidewall at the overlapping part. A slit **60** is formed between a side wall of the drawer-shape portion **112** and an upper portion of the tubular portion **111**. The seconded case **30** includes a top cap **31** and an installation portion **32** extending vertically downwards from two opposite sides of the top cap **31**. The top cap **31** has a U-shaped groove **311** and two shielding portions **312** beside the U-shaped groove **311**. The Installation portion **32** encloses the top part of the drawer-shaped portion **112**, and the top portion of the first case **11** extends through the U-shaped groove **311** and is exposed above the top cap **31**. The shielding portions **312** cover the slits **60**.

Referring to FIGS. **2-6**, the insulative housing **12** includes a main body **121** and a fixing member **1211** unitarily extending from a rear end of the main body **121** along a front-and-rear direction. The main body **121** is received in the receiving space **113** of the first case **11**. A number of dovetail slots **1212** are defined on the bottom side of the fixing member **1211**. The spacer **120** includes a first spacer **122** and a second spacer **123**, and both are fixed to the rear portion of the main body **121** under the fixing member **1211** and received in the receiving space **113** together with the insulative housing **12**, and a bottom sidewall of second spacer **123** abuts a top sidewall of

the first spacer **122**. A rear side of the first spacer **122** defines a first step **1221** and a second step **1222** along a bottom-and-top direction. Both bottom sidewalls of the first step **1221** and the second step **1222** define a number of receiving slots **1220** along a first direction which a plug connector is inserted or withdrawn, and the receiving slots **1200** extend through the first spacer **122** from a front sidewall to a rear sidewall thereof A number of receiving slots **1230** are defined through the second spacer **123** from the front sidewall to the rear sidewall thereof A number of fixing blocks **1231** corresponding to the dovetail slots **1212** of the fixing member **1211** are defined on the top side of the second spacer **123**. The fixing blocks **1231** are received and fixed in the corresponding dovetail slots **1212** for fixing the second spacer **123** to the bottom of the fixing member **1211**.

Referring to FIGS. **2-6**, the contact **13** includes a contacting portion **131**, a fixing portion **132** retained in the insulative housing **12**, and a soldering portion **133** for soldering with the cable wire. The soldering portions **133** of the contacts **13** are respectively received in the receiving slots **1220** and the receiving slots **1230**. The soldering portions **133** are soldered to the corresponding wires of the cable **20**.

Referring to FIGS. **4-6**, a sustaining portion **1200** is defined on the spacer **120**. The sustaining portion **1200** includes a first sustaining portion **124** outwardly extending from the two opposite ends of the first spacer **122** and a second sustaining portion **125** outwardly extending from the two opposite ends of the second spacer **123**. The first sustaining portion **124** and the second sustaining portion **125** are received in the slit **60** of the first case **11** to fill the slit **60**.

Referring to FIGS. **1-9**, in assembling, firstly, the contacts **13** are retained in the insulative housing **12**. The spacer **120** then is fixed to the rear portion of the insulative housing **12** and receives the rear ends of the contacts **13**. The wires of cable **20** are soldered to the corresponding contacts **13**. The combination of the insulative housing **12**, the spacer **120**, the contacts **13**, and the cable is received in the receiving space **113** of the tubular portion **111**. The second case **30** is engaged with the drawer-shaped portion **112**. The copper foil **40** encloses the rear portions of the first case **11** and the second case **30** and the front portion of the cable **20**. The insulative member **50** is over-molded around the copper foil **40**, and the front portion of the first case **11** is exposed to the outside of the insulative member **50**.

As shown and described, the sustaining portion **1200** extending from the spacer **120** fully fills the slits **60** so that the inner side of the copper foil **40** can be fully supported by the sustaining portion **1200** when the copper foil **40** covers the first case **11** and the second case **30**, insuring the copper foil **40** not to be broken during over-molding the insulative member **50** and thus not affecting the shielding effect of the cable connector assembly.

What is claimed is:

1. A cable connector assembly comprising:
a cable including a plurality of wires;
an insulative housing;
a plurality of contacts retained in the insulative housing and soldered to corresponding wires of the cable;
a spacer assembled to the insulative housing and retaining respective rear portions of the contacts;
a metal case enclosing the insulative housing and having a slit;
a copper foil enclosing the metal case and covering the slit; and
an insulative member over-molded on the copper foil and a front end of the cable;
wherein the spacer defines a sustaining portion extending into the slit for supporting a portion of the copper foil located above the slit.

2. The cable connector assembly according to claim **1**, wherein the metal case comprises a first case and a second case engaged with the first case, a receiving space is defined in the first case for receiving the insulative housing, and the slit is formed between the first case and the second case and communicates with the receiving space and an exterior.

3. The cable connector assembly according to claim **2**, wherein the first case comprises a tube portion and a drawer-shaped portion extending backwards from a rear portion of the tube portion, the slit is formed between a sidewall of the tube portion and a sidewall of the drawer-shaper portion.

4. The cable connector assembly according to the claim **3**, wherein the second case defines a U-shaped groove on a top sidewall thereof, a shielding portion is formed beside the groove, the first case extends through the groove, and the shielding portion of the second case covers the top of the slit.

5. The cable connector assembly according to the claim **4**, wherein the drawer-shaped portion extends obliquely and upwardly from the tube portion.

6. The cable connector assembly according to the claim **4**, wherein the tube portion comprises a top wall, a bottom wall, and a pair of side walls, the width of the top wall is smaller than the width of a bottom wall, the side wall has a pair of step-shaped portions, the receiving space is formed between the four walls, and a top portion of the first case extends through the groove.

7. The cable connector assembly according to claim **1**, wherein the spacer comprises a first spacer and a second spacer abutting a top sidewall of the first spacer, the first spacer and the second spacer are assembled to a rear portion of the insulative housing, the sustaining portion comprises a first sustaining portion extending from the first spacer and a second sustaining portion extending from the second spacer, and the first spacer and the second spacer fill in the slit.

8. The cable connector assembly according to claim **1**, wherein the spacer defines a number of receiving slots, a rear end of the contact is received in a corresponding receiving slot.

* * * * *